such topics as velocity, errors and rates, examples on maps, ex-
planations of planimeters and integraphs, and a study of mean
volumes, of center of pressure, and of the pendulum.

Any one who is experimenting with the calculus in secondary
schools will do well to have a copy of this work in hand, and,
indeed, to place it in the hands of the students as a source book
from which to draw the problems for class work. The chief
doubt as to its use as a textbook lies in the fact that the pub-
lishers find that war prices must still be maintained. This fact
will unquestionably be adverse to the sale that we would all like
to see in this country.

DAVID EUGENE SMITH

The New Methods in Arithmetic. By EDWARD L. THORNDIKE.
Rand McNally & Co. Pp. 260.

So many books on the teaching of arithmetic are either a mere
collection of discussions of miscellaneous topics more or less re-
lated or of platform addresses revised and edited for purposes
of publication. Usually such books are worth one reading but
not serious study. The present book is written for "the work-
ing teacher or student in a normal school seeking direct help in
understanding the newer methods and using them under condi-
tions of classroom instruction." It is an authoritative discus-
sion in non-technical language of the principles underlying the
teaching of arithmetic. Both the teacher and the student in-
terested in better teaching of arithmetic will want to read and
re-read, to study and study again, this illuminating book.

The main purpose of the author is to state and discuss the
general principles "that guide the teacher in choosing topics,
in arousing and utilizing interest, in securing understanding of
the science of arithmetic, ability to compute and ability to apply
arithmetic to the problems of the real world, and in organizing
arithmetic into a series of instructive experiences and activities."
At the same time he shows how to apply these general principles
"and also all the helpful conclusions that classroom experience
and scientific studies of the learning process have reached, to
every detail of the teaching of arithmetic."

Every chapter contains illustrations of the newer methods taken from the author's own textbooks in arithmetic. (The Thorndike Arithmetics, a three-book series, Rand McNally & Co.) In all, there are about sixty-five pages of these illustrations. Herein lies one important advantage of this book over any other book on the teaching of arithmetic. Every principle is amply illustrated by lessons and pages taken from these arithmetics written in accordance with what the author calls the newer methods. The illustrations are so satisfying that the reader will want to turn to the arithmetics from which they are taken to see them in their actual setting. In addition to this each chapter has at the close from two to six pages of very helpful exercises providing abundant opportunity for useful study.

The author is continually speaking by way of contrast about the newer methods and the older methods. Some readers will disagree with him in characterizing as older methods many plans of proceedure still in wide usage. For example, considerable time is spent by many teachers in developing with the pupils the fundamental processes with integers in terms of units, tens, hundreds, etc. The newer methods at the appropriate time say, ''This is the way to do it,'' and without any developmental explanation give in mechanical order the necessary steps to get the answer. Then some satisfactory proof that the result is right is given. This gives confidence that the procedure is correct, and thus the process is rationalized, according to the newer methods. At no time do the newer methods neglect the thought side of arithmetic. In fact the newer methods claim to teach the automatic phases of arithmetic in the most effective and economic way and thus have more time to concentrate greater effort where real thinking is actually needed. One evidence that the author is not altogether wrong is the fact that a few of the latest arithmetics have made copious use of the outstanding features of the Thorndike arithmetics.

There is need in the field of secondary mathematics for a similar book on the new methods in algebra and one on the new methods in geometry. Such books are needed to bring about a more united effort and a more apparent harmony in the teaching of secondary mathematics. However, teachers of secondary mathematics, and of junior high school mathematics, too, will be

benefited in reading *The New Methods in Arithmetic,* especially the chapters entitled "Reality," "Interest," "Theory and Explanations," "Habit Formation and Drills," and "Solving Problems." Any teacher of mathematics who studies this book will be encouraged to justify his methods and material on other than traditional grounds.

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